Residential System Sizing Calculation

Summary

Heather Model - Lot 9 Stonehenge

Lake City, FL

Project Title:
211048 Heather - Lot 9 Stonehenge

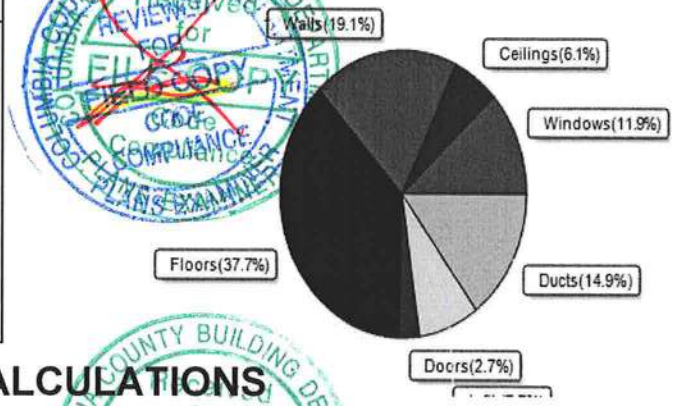
2021-08-06

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 ft.) Temp Range(M) Humidity data: Interior RH (50%) Outdoor wet bulb (77F) Humidity difference(51gr.)					
Winter design temperature(TMY3 99%)	30	F	Summer design temperature(TMY3 99%)	94	F
Winter setpoint	70	F	Summer setpoint	75	F
Winter temperature difference	40	F	Summer temperature difference	19	F
Total heating load calculation	**30016**	**Btuh**	**Total cooling load calculation**	**26436**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	109.9	33000	Sensible (SHR = 0.75)	108.6	24750
Heat Pump + Auxiliary(0.0kW)	109.9	33000	Latent	225.8	8250
			Total (Electric Heat Pump)	124.8	33000

WINTER CALCULATIONS

Winter Heating Load (for 1798 sqft)

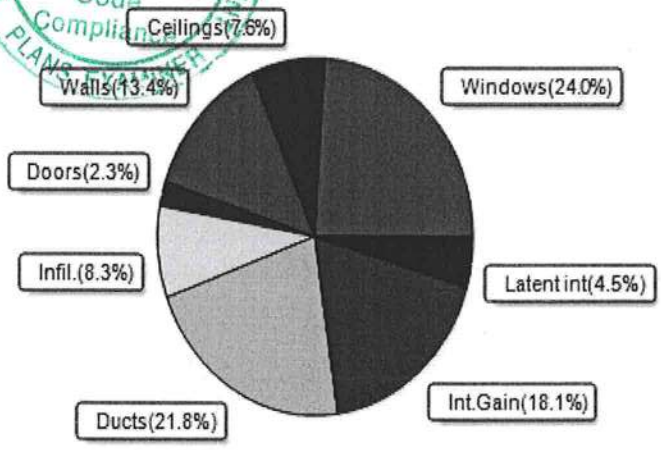
Load component			Load	
Window total	255	sqft	3565	Btuh
Wall total	1614	sqft	5730	Btuh
Door total	50	sqft	800	Btuh
Ceiling total	1798	sqft	1825	Btuh
Floor total	1798	sqft	11328	Btuh
Infiltration	53	cfm	2304	Btuh
Duct loss			4463	Btuh
Subtotal			**30016**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**30016**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 1798 sqft)

Load component			Load	
Window total	255	sqft	6348	Btuh
Wall total	1614	sqft	3551	Btuh
Door total	50	sqft	600	Btuh
Ceiling total	1798	sqft	2008	Btuh
Floor total			0	Btuh
Infiltration	39	cfm	821	Btuh
Internal gain			4780	Btuh
Duct gain			4675	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**22782**	**Btuh**
Latent gain(ducts)			1091	Btuh
Latent gain(infiltration)			1362	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			**3653**	**Btuh**
TOTAL HEAT GAIN			**26436**	**Btuh**



Powered by ACCA MANUAL J8 8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2021-08-06

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Heather Model - Lot 9 Stonehenge

Project Title:
211048 Heather - Lot 9 Stonehenge

Lake City, FL

Building Type: User

2021-08-06

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)
This calculation is for Worst Case. The house has been rotated 315 degrees.

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft) X	HTM=	Load
1	2, NFRC 0.25	Metal	0.35	NW	45.0	14.0	630 Btuh
2	2, NFRC 0.25	Metal	0.35	NE	13.3	14.0	187 Btuh
3	2, NFRC 0.25	Metal	0.35	NW	45.0	14.0	630 Btuh
4	2, NFRC 0.25	Metal	0.35	NW	40.0	14.0	560 Btuh
5	2, NFRC 0.25	Metal	0.35	NW	26.7	14.0	373 Btuh
6	2, NFRC 0.25	Metal	0.35	NW	15.0	14.0	210 Btuh
7	2, NFRC 0.25	Metal	0.35	NE	6.0	14.0	84 Btuh
8	2, NFRC 0.25	Metal	0.35	SE	15.0	14.0	210 Btuh
9	2, NFRC 0.25	Metal	0.35	SE	10.0	14.0	140 Btuh
10	2, NFRC 0.25	Metal	0.35	SE	15.0	14.0	210 Btuh
11	2, NFRC 0.25	Metal	0.35	SW	1.7	14.0	23 Btuh
12	2, NFRC 0.25	Metal	0.35	SW	16.0	14.0	224 Btuh
13	2, NFRC 0.25	Metal	0.35	SW	6.0	14.0	84 Btuh
	Window Total				254.7(sqft)		3565 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	80	3.55	283 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	159	3.55	563 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	54	3.55	191 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	40	3.55	142 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	53	3.55	189 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	88	3.55	312 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	78	3.55	276 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	285	3.55	1013 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	77	3.55	273 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	48	3.55	170 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	60	3.55	213 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	66	3.55	236 Btuh
13	Frame - Wood	- Adj	(0.089)	13.0/0.0	177	3.55	627 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	350	3.55	1241 Btuh
	Wall Total				1614(sqft)		5730 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)	7	16.0	107 Btuh
2	Insulated - Exterior,	n	(0.400)	13	16.0	213 Btuh
3	Insulated - Exterior,	n	(0.400)	10	16.0	160 Btuh
4	Insulated - Garage,	n	(0.400)	20	16.0	320 Btuh
	Door Total			50(sqft)		800Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/L/Shing	(0.025)	38.0/0.0	1798	1.0	1825 Btuh
	Ceiling Total			1798(sqft)		1825Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	240.0 ft(perim.)	47.2	11328 Btuh
	Floor Total			1798 sqft		11328 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Heather Model - Lot 9 Stonehenge
Lake City, FL

Project Title:
211048 Heather - Lot 9 Stonehenge
Building Type: User

2021-08-06

				Envelope Subtotal:			23249 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.22	14384	1.00	52.6	2304 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)				(DLM of 0.175)		4463 Btuh
All Zones				**Sensible Subtotal All Zones**			**30016 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	30016 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	30016 Btuh

EQUIPMENT

1. Electric Heat Pump	#	33000 Btuh

Key: Window types - NFRC (Requires U-Factor and Shading coefficient(SHGC) of glass as numerical values)
or - Glass as 'Clear' or 'Tint' (Uses U-Factor and SHGC defaults)
U - (Window U-Factor)
HTM - (ManualJ Heat Transfer Multiplier)

Version 8

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Heather Model - Lot 9 Stonehenge

Project Title:
211048 Heather - Lot 9 Stonehenge

Lake City, FL

2021-08-06

Reference City: Gainesville, FL Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.
This calculation is for Worst Case. The house has been rotated 315 degrees.

Component Loads for Whole House

Window	Type* Panes	SHGC	U	InSh	IS	Ornt	Overhang Len	Hgt	Window Area(sqft) Gross	Shaded	Unshaded	HTM Shaded	Unshaded	Load
1	2 NFRC	0.25, 0.35		No	No	NW	1.5ft	1.0ft	45.0	0.0	45.0	12	23	1055 Btuh
2	2 NFRC	0.25, 0.35		No	No	NE	99.0f	1.0ft	13.3	0.0	13.3	12	23	313 Btuh
3	2 NFRC	0.25, 0.35		No	No	NW	7.5ft	1.0ft	45.0	0.0	45.0	12	23	1055 Btuh
4	2 NFRC	0.25, 0.35		No	No	NW	12.5f	1.0ft	40.0	0.0	40.0	12	23	938 Btuh
5	2 NFRC	0.25, 0.35		No	No	NW	12.5f	1.0ft	26.7	0.0	26.7	12	23	625 Btuh
6	2 NFRC	0.25, 0.35		No	No	NW	1.5ft	1.0ft	15.0	0.0	15.0	12	23	352 Btuh
7	2 NFRC	0.25, 0.35		No	No	NE	1.5ft	1.0ft	6.0	0.0	6.0	12	23	141 Btuh
8	2 NFRC	0.25, 0.35		No	No	SE	1.5ft	1.0ft	15.0	4.4	10.6	12	25	313 Btuh
9	2 NFRC	0.25, 0.35		No	No	SE	10.0f	1.0ft	10.0	10.0	0.0	12	25	119 Btuh
10	2 NFRC	0.25, 0.35		No	No	SE	7.5ft	1.0ft	15.0	15.0	0.0	12	25	179 Btuh
11	2 NFRC	0.25, 0.35		No	No	SW	1.5ft	1.0ft	1.7	1.7	0.0	12	25	20 Btuh
12	2 NFRC	0.25, 0.35		No	No	SW	1.5ft	1.0ft	16.0	5.9	10.1	12	25	319 Btuh
13	2 NFRC	0.25, 0.35		No	No	SW	1.5ft	1.0ft	6.0	2.9	3.1	12	25	110 Btuh
	Excursion													810 Btuh
	Window Total								255 (sqft)					6348 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.09	13.0/0.0	79.7	2.3	180 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	158.7	2.3	359 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	53.7	2.3	121 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	40.0	2.3	91 Btuh
5	Frame - Wood - Ext	0.09	13.0/0.0	53.3	2.3	121 Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	88.0	2.3	199 Btuh
7	Frame - Wood - Ext	0.09	13.0/0.0	77.7	2.3	176 Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	285.3	2.3	646 Btuh
9	Frame - Wood - Ext	0.09	13.0/0.0	77.0	2.3	174 Btuh
10	Frame - Wood - Ext	0.09	13.0/0.0	48.0	2.3	109 Btuh
11	Frame - Wood - Ext	0.09	13.0/0.0	60.0	2.3	136 Btuh
12	Frame - Wood - Ext	0.09	13.0/0.0	66.3	2.3	150 Btuh
13	Frame - Wood - Adj	0.09	13.0/0.0	176.7	1.7	298 Btuh
14	Frame - Wood - Ext	0.09	13.0/0.0	349.7	2.3	791 Btuh
	Wall Total			1614 (sqft)		3551 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	6.7	12.0	80 Btuh
2	Insulated - Exterior	13.3	12.0	160 Btuh
3	Insulated - Exterior	10.0	12.0	120 Btuh
4	Insulated - Garage	20.0	12.0	240 Btuh
	Door Total	50 (sqft)		600 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/Light/Shingle	0.025	38.0/0.0	1798.0	1.12	2008 Btuh
	Ceiling Total			1798 (sqft)		2008 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	1798 (ft-perimeter)	0.0	0 Btuh
	Floor Total		1798.0 (sqft)		0 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Heather Model - Lot 9 Stonehenge | Project Title: 211048 Heather - Lot 9 Stonehenge | Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2021-08-06

				Envelope Subtotal:			12507 Btuh
Infiltration	Type Natural	Average ACH 0.16	Volume(cuft) 14384	Wall Ratio 1		CFM= 39.5	Load 821 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230		+	Appliance 3400	Load 4780 Btuh
				Sensible Envelope Load:			18107 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.258)			4675 Btuh
				Sensible Load All Zones			**22782 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Heather Model - Lot 9 Stonehenge | Project Title: 211048 Heather - Lot 9 Stonehenge | Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2021-08-06

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**18107 Btuh**
	Sensible Duct Load	4675 Btuh
	Total Sensible Zone Loads	**22782 Btuh**
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	**22782 Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	1362 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1091 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**3653 Btuh**
	TOTAL GAIN	**26436 Btuh**

EQUIPMENT

1. Central Unit	#	33000 Btuh

*Key: Window types (Panes - Number and type of panes of glass)
(SHGC - Shading coefficient of glass as SHGC numerical value)
(U - Window U-Factor)
(InSh - Interior shading device: none(No), Blinds(B), Draperies(D) or Roller Shades(R))
- For Blinds: Assume medium color, half closed
For Draperies: Assume medium weave, half closed
For Roller shades: Assume translucent, half closed
(IS - Insect screen: none(N), Full(F) or Half(½))
(Ornt - compass orientation)

Powered by ACCA MANUAL J8

Version 8